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CERTIFICATE

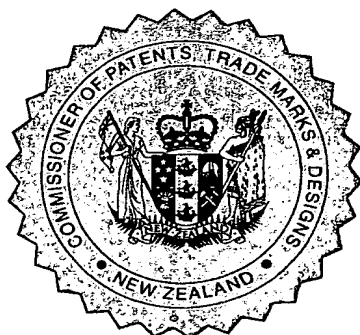
This certificate is issued in support of an application for Patent registration in a country outside New Zealand pursuant to the Patents Act 1953 and the Regulations thereunder.

I hereby certify that annexed is a true copy of the Provisional Specification as filed on 5 May 1999 with an application for Letters Patent number 335619 made by BRUCE RAYMOND MACKINNON.

Dated 11 May 2000.

Neville Harris

Neville Harris
Commissioner of Patents



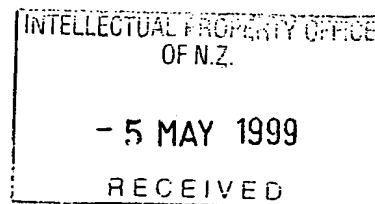
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NEW ZEALAND
PATENTS ACT, 1953

PROVISIONAL SPECIFICATION

“Wedge Locked Pole Step”

I, BRUCE RAYMOND MacKINNON, a New Zealand citizen of 1/36 Ashby Avenue, St. Heliers, Auckland, New Zealand, do hereby declare this invention to be described in the following statement:



This invention relates to the use of an easily installed removeable step for attachment to a steel utility pole or other thin wall hollow section structures. It also relates to a suspension bracket for use on a steel utility pole which is fitted in a similar way to the step.

Conventional utility poles are manufactured using one of two alternative constructions. Historically they have been either hard or soft wood poles but with modern manufacturing techniques thin wall steel poles are also becoming more common. The majority of such poles are employed in either telecommunications or electrical power transmission.

In order to fix faults or to assess condition of the attachments at the top of the pole, it is often necessary for servicemen to scale the pole and work near the top. In the case of a steel pole this can be accomplished in one of two ways - either by use of a ladder or steps integrated with the pole itself. The disadvantage to ladders is that they can be unstable and sometimes not long enough and therefore the risk of falling from the pole is higher. With wooden poles the use of ladders or provision of steps is not necessary because the servicemen are generally able to scale the pole using clamp-ons and a safety strap.

Increasingly suppliers are requesting that steel pole manufacturers supply their poles with steps already attached in order to avoid the problems associated with ladders. From the manufacturers perspective this poses a difficulty in the additional cost associated with integrating steps with the pole. Typically this may add up to 10% on the production cost putting the steel pole manufacturers at a distinct disadvantage to their wood pole counterparts.

The alternatives for attaching pole steps range from a nut welded to the side of the pole to a complicated four piece arrangement, shown in Figure 1, involving a shaped washer 1, shaped bolt 2, welded nut 3 and pressed steel step 4. These arrangements are hardly ideal, they are often very unstable and in some cases quite unsafe to work on. Also as previously mentioned they need to be attached to each pole when manufactured, adding additional costs, thereby reducing profit margins.

The object of this invention is to provide an easily installed removeable step that overcomes the abovementioned disadvantages.

In one aspect the present invention may be broadly said to consist in a step for a steel utility pole which comprises:

- a step;

- attachment means extending from the proximal end of said step which in use engage with said pole, and

- locking means associated with said attachment means which slide in relation to said

in use engage with said pole, and

locking means associated with said attachment means which slide in relation to said attachment means to a locking position to create a reaction force between said attachment means and said pole.

This invention may also be said broadly to consist in the parts, elements and features referred to or indicated in the specification of the application, individually or collectively, and any or all combinations of any two or more of said parts, elements or features, and where specific integers are mentioned herein which have known equivalents in the art to which this invention relates, such known equivalents are deemed to be incorporated herein as if individually set forth.

The invention consists in the foregoing and also envisages constructions of which the following gives examples.

One preferred form of the present invention will now be described with reference to the accompanying drawings in which;

Figure 1 is an illustration of a prior art step

Figure 2 is an illustration of a steel utility pole;

Figure 3 is a cut-away view showing the pole step attached to the steel utility pole;

Figure 4a is a plan view of the pole step;

Figure 4b is a side view of the pole step;

Figure 4c is a frontal view of the pole steps;

Figure 5 is a plan view of an alternative wedge;

Figure 6a is a plan view of the wedge in the second embodiment;

Figure 6b is a frontal view of the wedge in the second embodiment, and

Figure 7 is a side view of the second embodiment step.

The invention as described is a pole step for attachment to a steel utility pole which is able to be easily attached to the pole as and when required. The step is locked in place once attached using a wedge to ensure that it provides a secure and firm platform from which servicemen can work. The wedge may be adapted to fit any shape of utility pole and be repeatably attached and removed by servicemen each time they need to scale a pole.

A typical steel utility pole 1, shown in Figure 2, is used by utilities to carry their wires 2. The steps 3 are spaced at an even interval to allow the servicemen (not shown) to scale the pole 1 to a point where the serviceman can work on the attachments 4 at the top of the pole 5. Steps are not provided on the lower section of the pole to stop passerbys being able to scale the pole 1. The servicemen will scale the first step 6 using a ladder (not shown) or other climbing means.

The pole step 3, as shown in more detail in Figure 3, is designed to be removably

attached to the pole 1. The step 3 is comprised of a tapered support surface 10 for the servicemen to stand on while climbing the pole 1 or working on the attachments 4. Integral with the support surface 10 is a hook 11 which is leverably inserted into a hole 12 in the exterior of the pole 1 and providing the opposing force to hold the step 3 in place. The support surface 10 is terminated at its distal end with a lip 13 to prevent the footwear of the serviceman from slipping off the edge of the step 3. The step and integral hook may be constructed either from cast aluminium, cast SG iron, forged steel or any other robust material.

The wedge 20 is designed such that once the hook 11 has been inserted into the exterior of the pole the wedge can be inserted between the exterior 21 of that utility pole and the breach 23 of the step 3. Once inserted the wedge will lock the step in place providing firm vertical and horizontal support such that any servicemen will be assured a safe working platform.

The wedge 20, shown in more detail in Figures 4a, 4b and 4c is tapered on two sides 30, 31 and one face 32. Looking towards the pole, shown in Figure 4b, the wedge 20 sides are tapered, being widest at the lowest most portion 33 and narrowest at the uppermost portion 34. This is to ensure adequate seating of the breach 23 of the step 3. Looking now from the side (parallel to the side of the face of the pole), the outermost face of the wedge is tapered, being widest at its uppermost portion 34 and narrowest at its lowermost portion. This allows easy attachment of the step 3 to the pole. The hook 11 is inserted into the hole 12 whereupon the wedge 20 is dropped and firmly sealed in place from above.

Looking now from above, seen in Figure 4a, the innermost face 40 of the wedge is substantially circular in shape, with small flat sections 41 on either side. The circular section 40 is designed to adapt to circular, hexagonal/octagonal poles with the flat sections 41 provided for where the wedge faces a flat surface, eg: larger poles with wide faces. The innermost face 40 is tapered to mould to the typical shape of a conventional steel utility pole. For more confidence on larger poles with wide faces an alternative wedge, seen in Figure 5, can be used with a completely flat innermost face 50.

To accommodate the shaft of the hook 11, a channel 51 is provided in the body of the wedge. An inset panel 52 is provided on the outmost face of the wedge to accommodate the breach 22 of the step, to ensure once in place the wedge cannot slip out of its correct position. The wedge can be fabricated using SG iron, forged steel, injection moulded plastic, or alternatively using rubber.

In a second embodiment an alternative wedge is shown in Figure 6a without tapering sides and can be constructed using slightly less material than that described in the preceding embodiment. Looking now from above the innermost face 60 of the wedge 61

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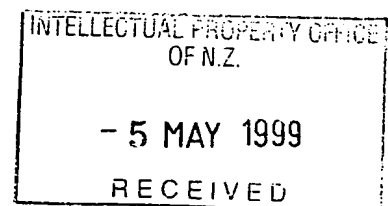
is substantially "V" shaped and substantially rectangular in outline. Looking now away from the pole, shown in Figure 6b the "V" is tapered to substantially mould to the typical shape of typical steel utility poles. The flat sections 62 are widest at the uppermost portion 63 and taper to nothing at the lowermost portion 64.

In the second embodiment the step 70 shown in Figure 7 is provided with a key portion 71 protruding from the breach 72 which is designed to fit into the channel 73 of the wedge 61. Once locked in place this prevents the step 70 from rotating and ensures that the step 70 stays locked in place.

In a third embodiment the step 80, hook 81 and wedge 82 are all movable relative to one another, as shown in Figure 8. With this embodiment the hook 81 is leverably inserted into a hole 83 in a steel utility pole 84, with the wedge 82 in the upper position 85. The hook 81 has grooves 86 in both sides which the wedge 82 engages with. With the hook 81 inserted in the hole 83 the wedge is brought to a lower locked position 87. The movement of the wedge 82 causes the distal side 88 of the groove to experience a lateral force, effecting a compressive force between the end of the hook 89 and the breach of the wedge 90 on the wall of the pole.

It will be apparent from the description that a step design such as that described will be equally applicable to any application which requires an object to be suspended from a thin wall hollow structure. Examples include the suspension of fibre optic cables and many other line hardware fittings as will be appreciated are appropriate.

DATED THIS 5 DAY OF May 1999
A.J. PARK & SON
PER *VP*
AGENTS FOR THE APPLICANT



PRIOR ART

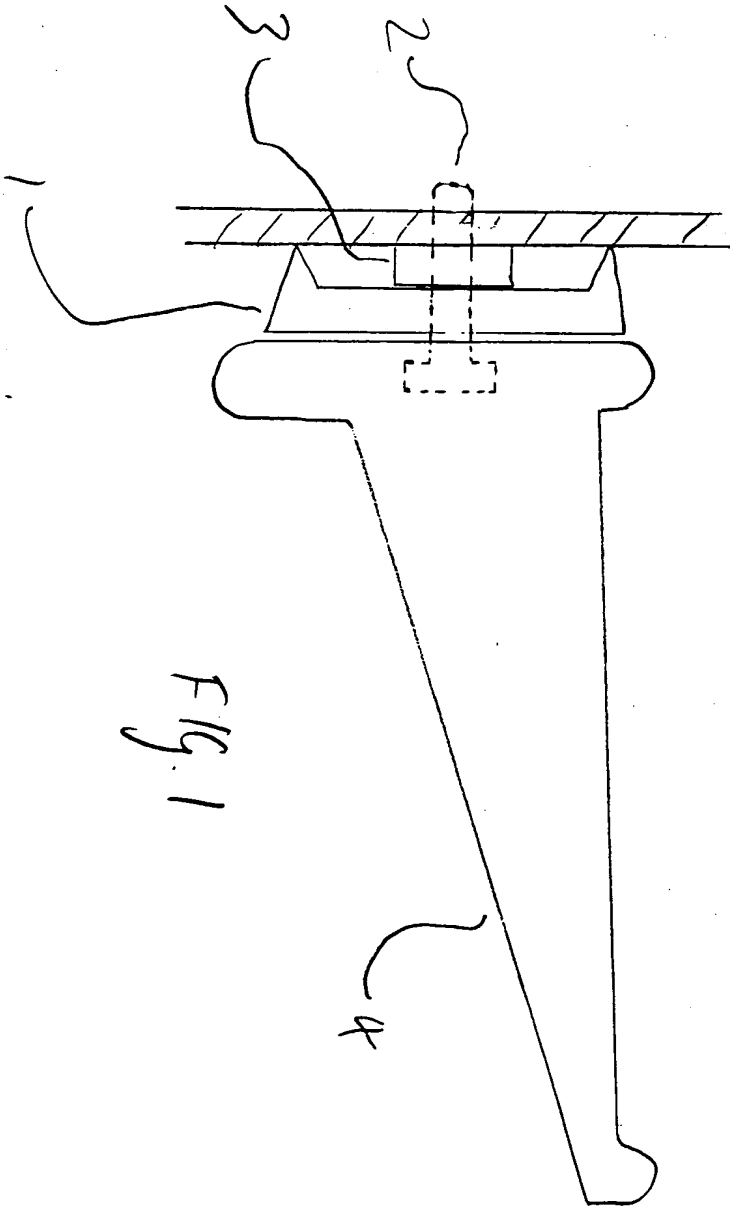


Fig. 1

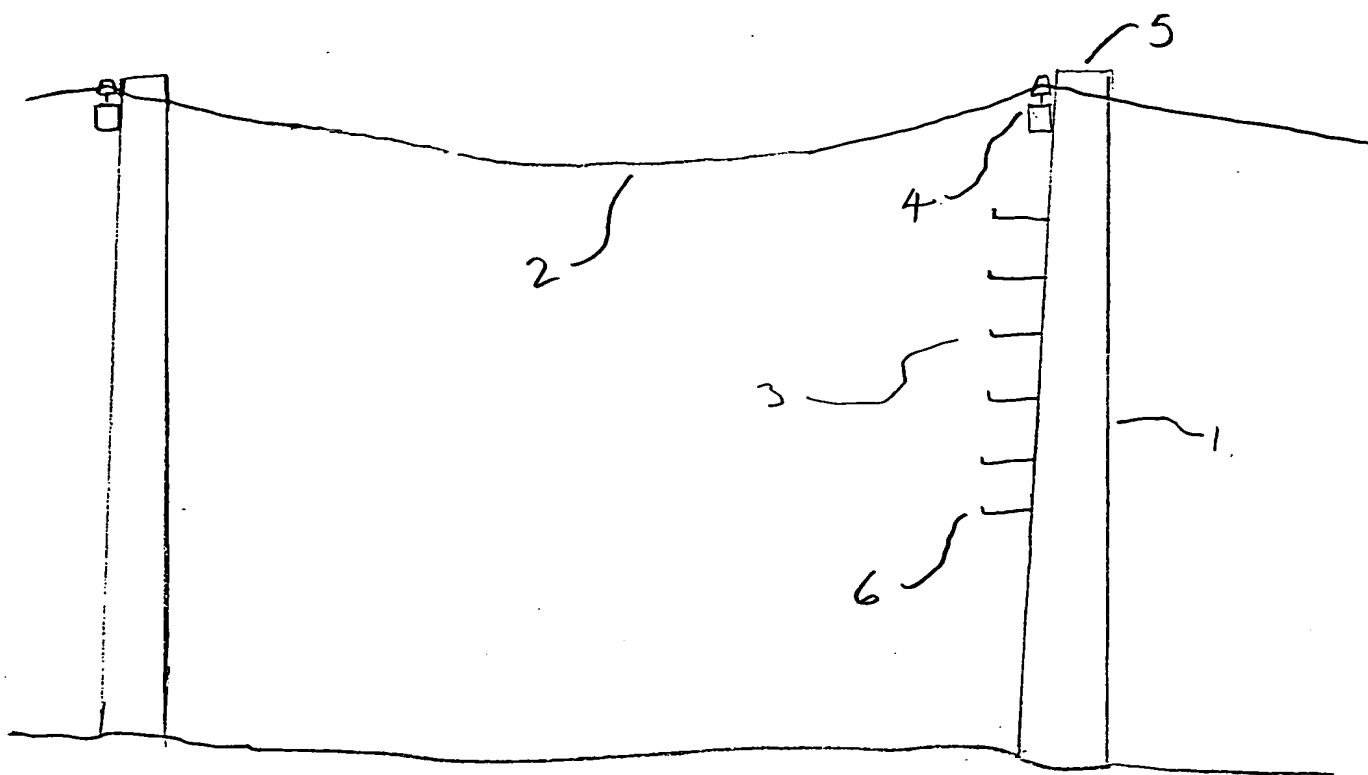


Fig. 2

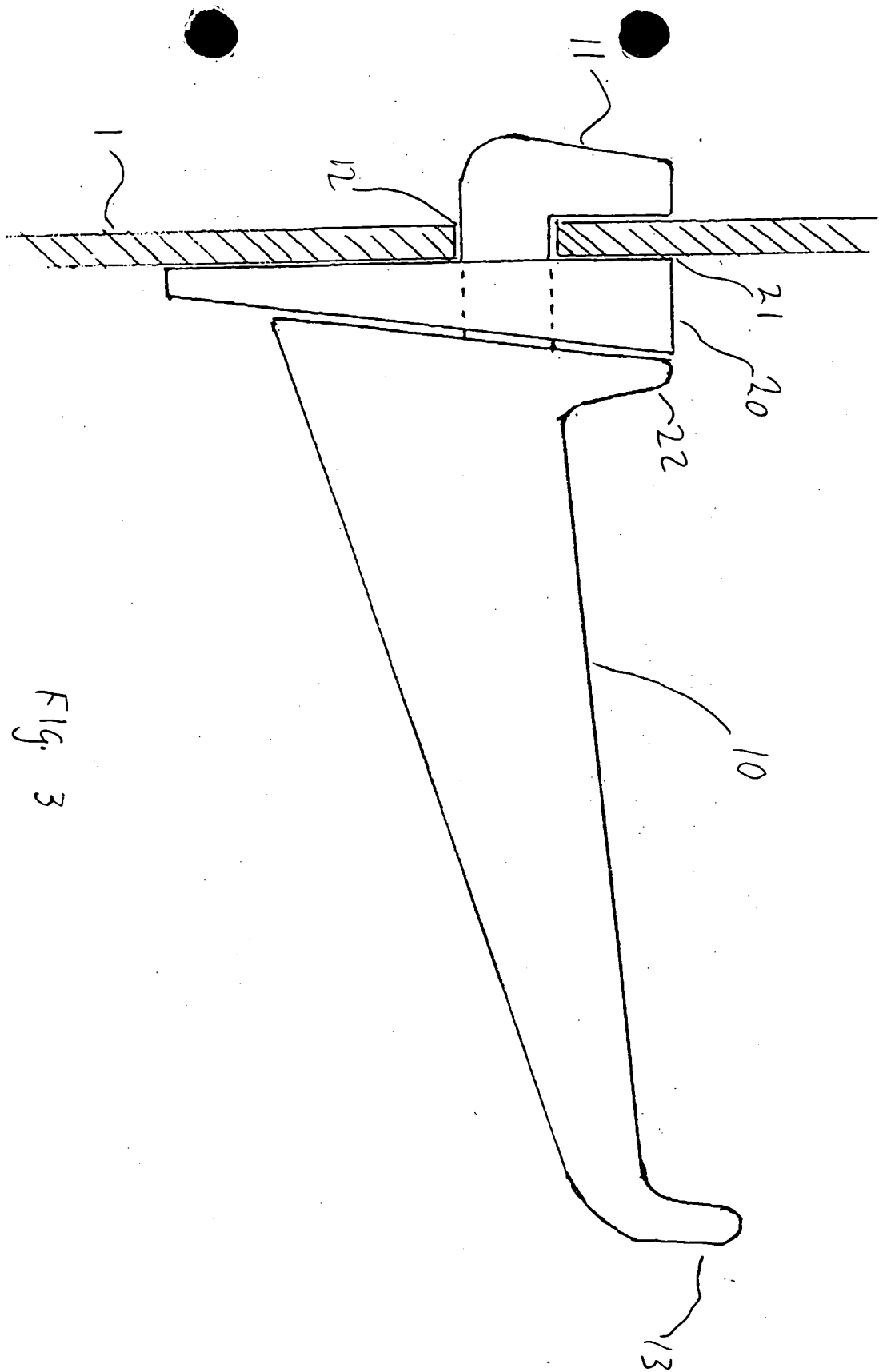
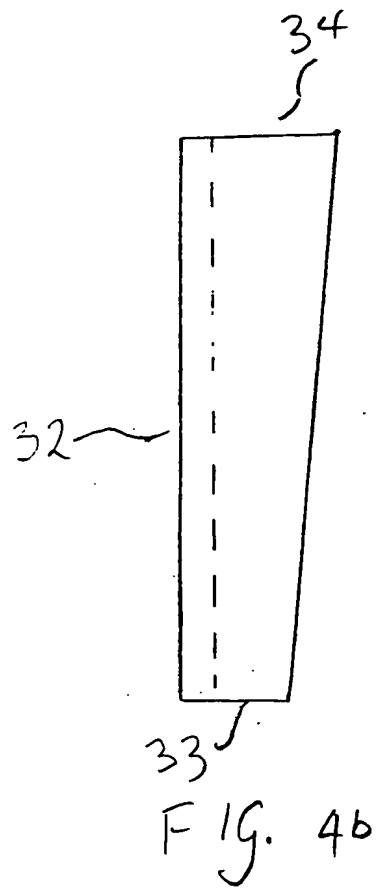
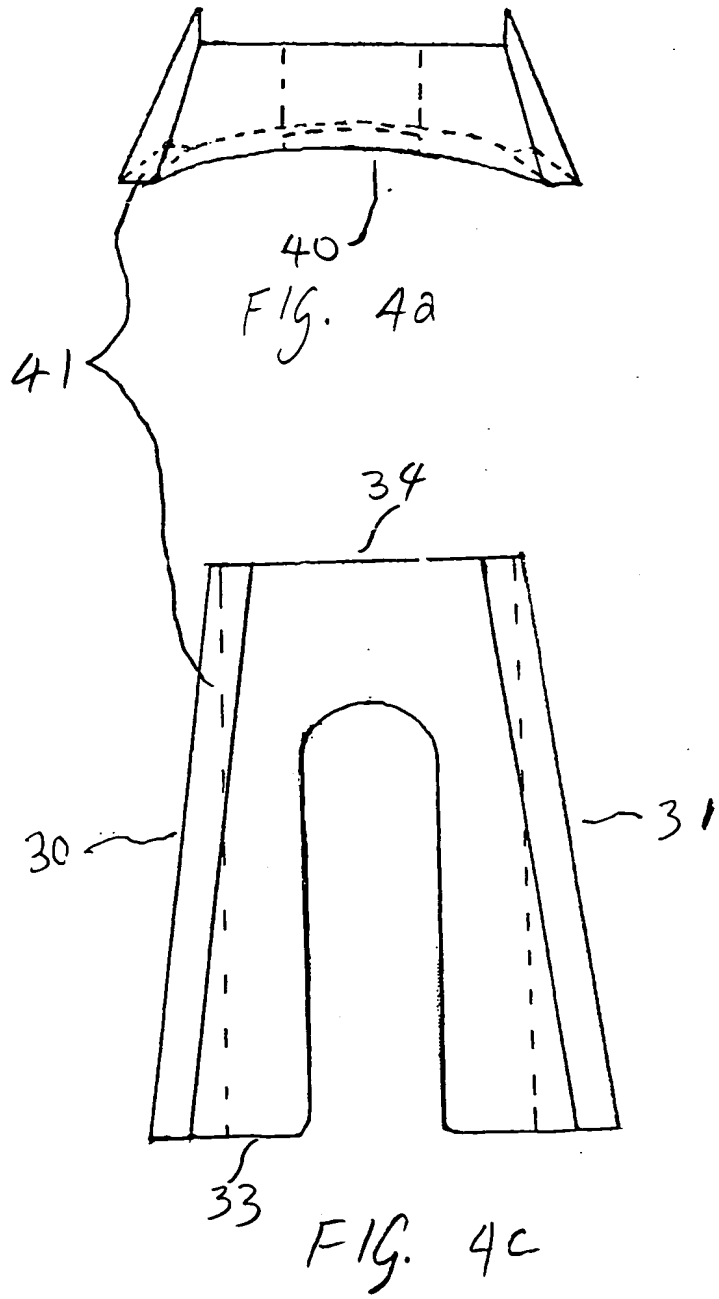
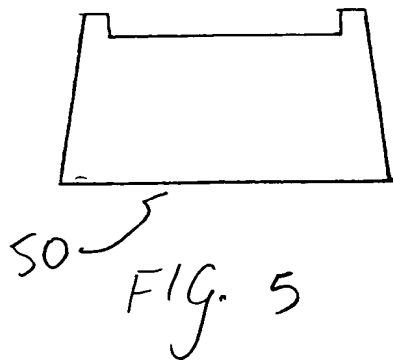


Fig. 3



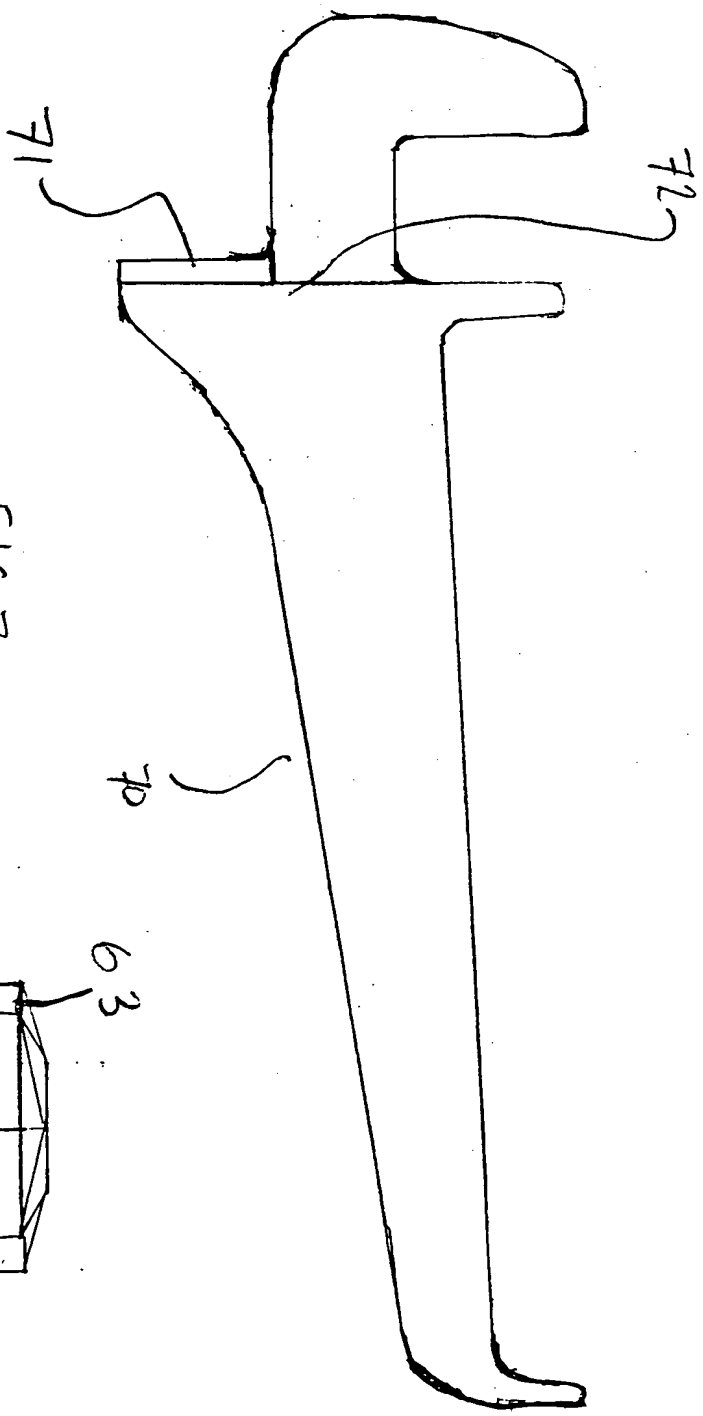


Fig. 7

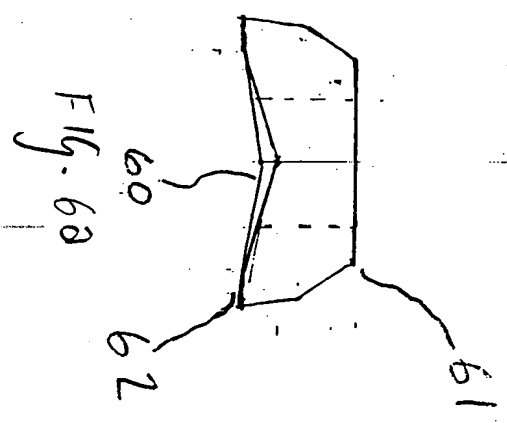


Fig. 6a

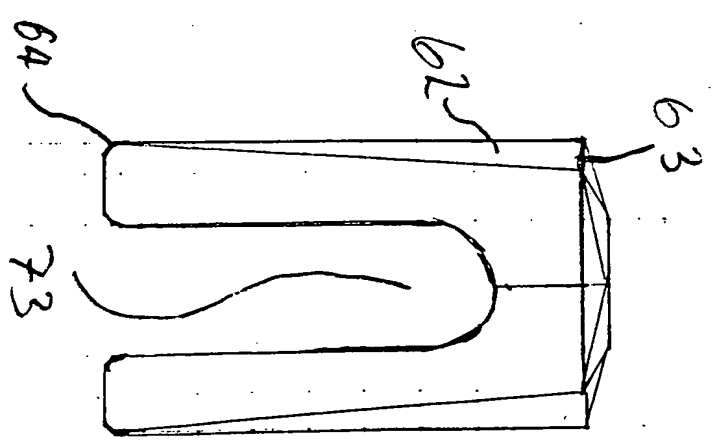


Fig. 6b

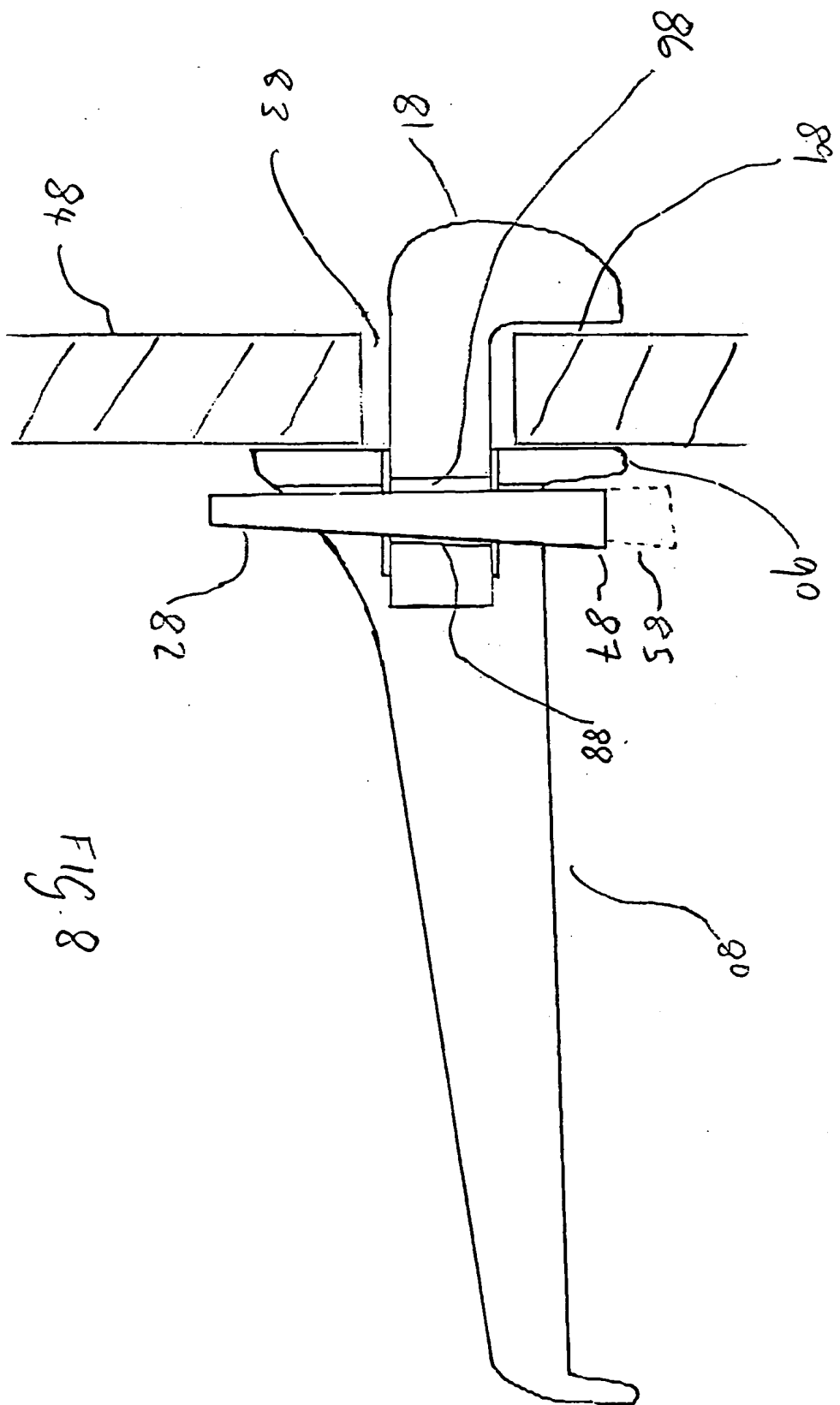


FIG. 8